

WHAT IS CLAIMED IS:

1. An antenna structure, comprising:

an antenna trace formed on a substrate proximate a ground plane of said substrate; and

an insulation region extending through said substrate and located between said antenna trace and said ground plane.

2. The antenna structure recited in Claim 1 wherein said insulation region includes a plurality of insulation regions.

3. The antenna structure recited in Claim 2 wherein each of said insulation regions are separated by a portion of said substrate.

4. The antenna structure recited in Claim 1 wherein said insulation region is an opening that extends through said substrate and an insulator of said insulation region is air.

5. The antenna structure recited in Claim 1 wherein said insulation region includes an insulation material selected from a group consisting of:

ABS plastic;

ceramic; and

6 Teflon.

6. The antenna structure recited in Claim 1 wherein said
2 antenna trace includes antenna traces located on opposing surfaces
3 of said substrate.

7. The antenna structure recited in Claim 1 wherein said
2 antenna traces are interconnected by vias extending through said
3 substrate.

8. A method of manufacturing an antenna structure,
2 comprising:
3 forming an antenna trace on a substrate proximate a ground
4 plane of said substrate; and
5 creating an insulation region extending through said substrate
6 and located between said antenna trace and said ground plane.

9. The method recited in Claim 8 wherein said creating
2 includes creating a plurality of insulation regions.

10. The method recited in Claim 8 wherein said creating a
2 plurality of insulation regions includes creating a plurality of
3 insulation regions separated by a portion of said substrate.

11. The method recited in Claim 8 wherein said creating an
2 insulation region includes creating an opening that extends through
3 said substrate and wherein an insulator of said insulation region
4 is air.

12. The method recited in Claim 11 wherein said creating an
2 opening includes drilling a hole in said substrate.

13. The method recited in Claim 8 wherein said creating
2 includes creating an insulation region having an insulation
3 material selected from a group consisting of:

4 ABS plastic;
5 ceramic; and
6 Teflon.

14. The method recited in Claim 8 wherein said forming
2 includes forming antenna traces located on opposing surfaces of
3 said substrate interconnected by vias extending through said
4 substrate.

15. A printed circuit board (PCB), comprising:

a substrate having a ground plane and conductive traces formed thereon; and

an antenna structure, including:

an antenna trace formed on said substrate proximate said ground plane; and

an insulation region extending through said substrate and located between said antenna trace and said ground plane.

16. The PCB recited in Claim 15 further including electrical components mounted on said substrate and interconnected between at least one of said conductive traces and said ground plane to form an operative circuit.

17. The PCB recited in Claim 15 wherein said insulation region includes a plurality of insulation regions separated by a portion of said substrate.

18. The PCB recited in Claim 15 wherein said insulation region is an opening that extends through said substrate and an insulator of said insulation region is air.

19. The PCB recited in Claim 15 wherein said insulation region includes an insulation material selected from a group consisting of:

4 ABS plastic;
5 ceramic; and
6 Teflon.

20. The PCB recited in Claim 15 wherein said antenna trace
2 includes antenna traces located on opposing surfaces of said
3 substrate interconnected by vias extending through said substrate.